

Department of the Interior
U.S. Geological Survey

CONTROL AND SCHEDULE INTERFACE SYSTEM (CSIS) SYSTEM TEST PLAN

CSIS 1.2.0

Version 2

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Section 1 Introduction

1.1 Purpose and Scope

This document provides the necessary procedures to verify Configuration Change Requests (CCRs) assigned to a CSIS software release. In addition to providing procedures for test execution, this document defines test assumptions, constraints, test data, test tools and any special system configuration items.

1.1.1 Objective

The objective of system test will be to verify that changes completed for the release produce the desired results.

1.1.2 Limitations

Due to limited resources there will be limitations posed on System Test. This may include simulating interfaces where needed. Section 2 will describe any specific limitations on System Test.

1.1.3 Test Approach

The strategy for testing each CCR is to focus on the changes completed with regression tests performed as needed. Test cases that cannot be verified by testing will be verified by inspection.

1.1.4 Test Data

Landsat 5 and Landsat7 data will be used for System Test. The data will consist of L5 North American Air Defense (NORAD) Two Line Element (TLE) files, L7 Improved Inter-Range Vector (IIRV) files, and contact schedules for both L5 and L7. This data will be copied from operations to the test environment and retrieved from outside servers when applicable.

Section 2 System Test Considerations

2.1 Assigned CCRs

The specific CCRs for release 3.1.0 are listed in [Table 2-1](#).

CCR	Title
4678	CSIS - Unable to parse L7 ephemeris for DOY 365 when new year 2007 DOY 001 ephem was also present
4717	CSIS - Incorporate L5 FTP 'get' scripts into the tool
4722	CSIS - Incorporate local FTP 'put' scripts into the tool

Table 2-1 CSIS 1.2.0 Assigned CCRs

2.2 System Configuration

The configuration for System Test is shown in [Table 2-2](#). If a special configuration is needed for a Test Procedure it will be documented in that procedure.

System	Environment
CSIS backup	CSIS ST
TDF	Ops
GSC	Ops

Table 2-2 System Test Configuration

2.3 System Test Limitations

The following is a list of known system test limitations for this testing effort:

1. Where needed, some interfaces may need to be simulated.
2. Due to the need to test on production systems; all testing will occur after the daily supports are completed.
3. The L7 Support and Multi-mission Operations Test Cases will involve sending Doppler data to the L7 MOC. This testing should be coordinated with the MOC to prevent confusion.

2.4 System Test Assumptions

This System Test will assume that current TLE, IIRV, schedule files will be available to the Tester.

2.5 Regression Testing

The Generic Test Cases from the Appendix shall be used for Regression Testing at a minimum. Additional testing may be done at the discretion of Operations.

2.6 System Test Schedule

To be supplied by the Systems Engineer. The test period is currently scheduled for June 25 – July 9, 2007.

Section 3 Test Procedures

3.1 DOY 365 IIRV

3.1.1 CCR 4678 – CSIS - Unable to parse L7 ephemeris for DOY 365 when new year 2007 DOY 001 ephemeris was also present.

3.1.2 Objective: Verify the resolution of the IIRV parsing is corrected to allow for year rollover.

3.1.3 Test Data

Day 364 L7 Contact Schedule and L7 IIRV.

3.1.4 DOY 365 IIRV

Step	Action	Response
1.	Copy DOY 001 IIRV and schedules to the development CSIS.	
2.	Consult with the Systems Engineer to configure the system for this test.	
3.	Start CSIS (A.2.1) as Steps 1-3 dcsst.	The CSIS is started.
4.	Perform mock L7 Support (A.2.4)	The CSIS should attempt to send the correct time elements to the GSC.
5.	Stop CSIS (A.2.2).	
6.	Remove contacts from TDF and GSC (if applicable).	

3.2 L5 Schedule and Ephemeris Retrieval

3.2.1 CCR 4717 – CSIS - Incorporate L5 FTP 'get' scripts into the tool.

3.2.2 Objective: Verify the CSIS automatically retrieves L5 data.

3.2.3 Test Data

Any nominal L5 Schedule and L5 Ephemeris data.

3.2.4 L5 Schedule and Ephemeris Retrieval

Step	Action	Response
1.	Stop CSIS (A.2.2).	
2.	Configure CSIS Environment (A.1.1).	This step is required to configure for L5 retrieval.
3.	Start CSIS with no data (A.1.2) Steps 1-4 as dcsst.	The CSIS is started.
4.	Verify L5 schedules and ephemeris are retrieved by checking: /usr/moc/lgs/schedules_delivery/L5/ /usr/moc/lgs/ephemeris_delivery/L5	
5.	Copy the contact schedule to /usr/moc/lgs/schedules_delivery/L5/processed_schedules	

6.	Verify the CSIS counts down to the event.	5 minutes prior to the even, the journal will indicate: No work to do for L5 event at 2006 <i>ddd</i> <i>hh:mm:ss</i> . Next contact....
7.	Stop CSIS (A.2.2).	
8.	Remove contacts from TDF and GSC.	

3.3 Data Dissemination

3.3.1 CCR 4722 – CSIS - Incorporate local FTP 'put' scripts into the tool.

3.3.2 Objective: Verify the CSIS is still able to disseminate data to the TDF and GSC.

3.3.3 Test Data

Any nominal L5 Schedule, L5 Ephemeris, L7 Schedule and L7 Ephemeris data.

3.3.4 Data Dissemination

Step	Action	Response
1.	Import L7 data (A.1.3)	
2.	Verify the L7 schedules and ephemeris are retrieved by checking: /usr/moc/lgs/schedules_delivery/L7/ /usr/moc/lgs/ephemeris_delivery/L7	
3.	Start CSIS (A.2.1) Steps 1-3 as dcsst.	The CSIS is started.
4.	Verify L5 schedules and ephemeris are retrieved by checking: /usr/moc/lgs/schedules_delivery/L5/ /usr/moc/lgs/ephemeris_delivery/L5	
5.	Copy the contact schedules to /usr/moc/lgs/schedules_delivery/L5/processed_schedules /usr/moc/lgs/schedules_delivery/L5/processed_schedules	
6.	Verify events are scheduled on the GSC and TDF. TDF: Verify the touch screen displays the events you scheduled. GSC: In the LGS Ground Station Controller Screen <ul style="list-style-type: none"> • Select Operations from the menu bar • Choose Operations Schedule • In the activities section the events will appear. 	The CSIS journal will indicate: File xxx transferred successfully to the TDF. File xxx transferred successfully to the GSC. Please verify passes have been scheduled on the TDF and GSC.
7.	Stop CSIS (A.2.2).	
8.	Remove contacts from TDF and GSC.	

Appendix A Generic Test Procedures

A.1 Initial Configuration

A.1.1. Environment

	Step	Notes or Outcome
1.	Log on to the CSIS machine	
2.	In the dcsst user home directory %vi .cshrc	
3.	Verify the following lines: setenv CSIS_HOME /usr/CSIS/st setenv PATH \$CSIS_HOME/bin:\$PATH alias get5ephem '/root/bin/contact_cron1/main' alias get5sched '/root/bin/contact_cron/main'	This will set the CSI_HOME variable, add the path, and configure aliases for L5 data retrieval.
4.	%cd \$CSIS_HOME/setup	This is the configuration directory
5.	Verify the systems to the right appear and update the passwords as appropriate. %vi ftplogin.ini	NOTE: these systems will be using the production accounts. TDF 150.144.191.101 dcsuser password /schedules GSC_EPH 150.144.191.100 dcs password /ephem GSC_SCH 150.144.191.100 dcs password /sch L5_EPH 150.144.192.195 user lgs_l5@129.165.2.92 password /LS5/ProductRepository/Outbound/Lgs_L5/OrbitalElement L5_SCH 150.144.192.195 user lgs_l5@129.165.2.92 password /LS5/ProductRepository/Outbound/Lgs_L5/ContactSchedule
6.	Verify the paths to the right match. %vi csis_setup.ini	CSIS_POLL_INTERVAL_SEC 900 CSIS_EVENT_PREP_THRESHOLD_SEC 900 CSIS_L5_SCHED_PATH_STAGING /usr/moc/lgs/schedules_delivery/L5 CSIS_L7_SCHED_PATH_STAGING /usr/moc/lgs/schedules_delivery/L7 CSIS_L5_SCHED_PATH_PROCESSED /usr/moc/lgs/schedules_delivery/L5/processed_schedules CSIS_L7_SCHED_PATH_PROCESSED /usr/moc/lgs/schedules_delivery/L7/processed_schedules CSIS_L5_EPHEM_PATH /usr/moc/lgs/ephemeris_delivery/L5 CSIS_L7_EPHEM_PATH /usr/moc/lgs/ephemeris_delivery/L7

A.1.2. Start System with No Data

	Step	Notes or Outcome
1.	Log on to the CSIS machine	

2.	Insure no data is present in the staging or processed directories.	/usr/moc/lgs/schedules_delivery/L5/ /usr/moc/lgs/schedules_delivery/L7/ /usr/moc/lgs/schedules_delivery/L5/processed_schedules /usr/moc/lgs/schedules_delivery/L7/processed_schedules /usr/moc/lgs/ephemeris_delivery/L5 /usr/moc/lgs/ephemeris_delivery/L7
3.	Start the CSIS Journal %cd /usr/CSIS/ %tail -f CSIS_Journal	
4.	Start the CSIS software in a separate window %csis	After entering you will return to a command prompt. The journal will indicate: Polling for updates completed. No valid contact schedule entries exist.
5.	Stop the CSIS software % quit.sh	The journal will indicate: CSIS terminated by user. CSIS is terminating.

A.1.3. Import L7 data

	Step	Notes or Outcome
1.	Copy the most recent ephemeris and schedules from the production CSIS via floppy disk to the directories below: CSIS_L7_EPHEM_PATH /usr/moc/lgs/ephemeris_delivery/L7 CSIS_L7_SCHED_PATH_PROCESSED /usr/moc/lgs/schedules_delivery/L7/processed_schedules	

A.2 Normal Operations

A.2.1. Start System

	Step	Notes or Outcome
1.	Log on to the CSIS machine	
2.	Start the CSIS Journal %cd /usr/CSIS/ %tail -f CSIS_Journal	
3.	Start the CSIS software in a separate window %csis	After entering you will return to a command prompt. The journal will indicate: Starting contact reformatting. Completed contact reformatting. NOTE: The journal will indicate passes that appear in the contact for past times as "missed" events. This will only occur if the software is restarted or if an old schedule is loaded.
4.	Attempt to start a second instance of CSIS software %csis	A second instance will not be allowed. The journal will indicate: CSIS is already running; stopping new instance. CSIS failed to start.

A.2.2. Stop System

	Step	Notes or Outcome
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1.	When the system is in sleep mode (waiting for next polling interval) stop the CSIS software %quit.sh	The journal will indicate: CSIS terminated by user. CSIS is terminating.
2.	Restart the CSIS following Start CSIS (A.2.1) Steps 1-3	
3.	%cd /usr/moc/lgs/schedules_delivery/L7/processed_schedules	
4.	Copy a current schedule to a higher version (i.e. .S02) within the same directory	
5.	Immediately stop the CSIS software %quit.sh	The formatting will complete and the journal will indicate: CSIS terminated by user. CSIS is terminating. NOTE: Due to the polling interval and speed of the CSIS it is unlikely that the stop command will occur during ingest, but it still should be attempted.

A.2.3. L5 Support

	Step	Notes or Outcome
1.	Notify the L5 MOC or have Operations Lead notify the MOC that testing will be occurring and small Doppler files will be generated and FTP'd to the MOC	The TDF will automatically send Doppler files to the MOC after an event is scheduled to end.
2.	Stop the CSIS software %quit.sh	The journal will indicate: CSIS terminated by user. CSIS is terminating.
3.	%cd \$CSIS_HOME/setup	
4.	Change the CSIS_POLL_INTERVAL_SEC and CSIS_EVENT_PREP_THRESHOLD_SEC to 300 seconds %vi csis_setup.ini	
5.	%cd /usr/moc/lgs/schedules_delivery/L5/	
6.	Copy a recent L5 schedule to \$CSIS_HOME or a directory of your choosing.	
7.	Modify your copy of the L5 schedule file to have 3 supports, each lasting 2 minutes in duration, and scheduled 10 minutes apart. Delete any other events appearing in the schedule. The first support should be scheduled to start 7 minutes from the current time.	It is important to insure the passes are scheduled no closer than the defined polling interval.
8.	Move the file to /usr/moc/lgs/schedules_delivery/L5/processed_schedules.	
9.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	The journal will indicate: Starting contact reformatting. Completed contact reformatting.

10.	<p>Verify the events are scheduled on the GSC and TDF.</p> <p>TDF: Verify the touch screen displays the three events you scheduled.</p> <p>GSC: In the LGS Ground Station Controller Screen</p> <ul style="list-style-type: none"> • Select Operations from the menu bar • Choose Operations Schedule • In the activities section the 3 events will appear. 	<p>The CSIS journal will indicate transferred successfully to the TDF and GSC. Please verify passes have been scheduled on the TDF and GSC.</p>
11.	<p>Verify the CSIS counts down to the event.</p>	<p>5 minutes prior to the even, the journal will indicate: No work to do for L5 event at 2006 <i>ddd hh:mm:ss</i>. Next contact....</p>
12.	<p>Monitor the event on the GSC and TDF.</p>	
13.	<p>Repeat steps 10-11 for the remaining events.</p>	
14.	<p>Stop the CSIS software %quit.sh</p>	
15.	<p>%cd \$CSIS_HOME/setup</p>	
16.	<p>Change the CSIS_POLL_INTERVAL_SEC back to 900 seconds %vi csis_setup.ini</p>	

A.2.4. L7 Support

	Step	Notes or Outcome
1.	<p>Notify the L7 MOC or have Operations Lead notify the MOC that testing will be occurring and small Doppler files will be generated and FTP'd to the MOC</p>	<p>The TDF will automatically send Doppler files to the MOC after an event is scheduled to end.</p>
2.	<p>Stop the CSIS software %quit.sh</p>	<p>The journal will indicate: CSIS terminated by user. CSIS is terminating.</p>
3.	<p>%cd \$CSIS_HOME/setup</p>	
4.	<p>Change the CSIS_POLL_INTERVAL_SEC and CSIS_EVENT_PREP_THRESHOLD_SEC to 300 seconds %vi csis_setup.ini</p>	
5.	<p>%cd /usr/moc/lgs/schedules_delivery/L7/</p>	
6.	<p>Copy a recent L7 schedule to \$CSIS_HOME or a directory of your choosing.</p>	
7.	<p>Modify your copy of the L7 schedule file to have 3 supports, each lasting 2 minutes in duration, and scheduled 10 minutes apart. Delete any other events appearing in the schedule. The first support should be scheduled to start 7 minutes from the current time.</p>	<p>It is important to insure the passes are scheduled no closer than the defined polling interval.</p>
8.	<p>Rename your copy to a higher version (i.e. .S02)</p>	
9.	<p>Move the file to /usr/moc/lgs/schedules_delivery/L7/processed_schedules.</p>	
10.	<p>Start the CSIS following Start CSIS (A.2.1) Steps 1-3</p>	<p>The journal will indicate: Starting contact reformatting. Completed contact reformatting.</p>

11.	<p>Verify the events are scheduled on the GSC and TDF.</p> <p>TDF: Verify the touch screen displays the three events you scheduled.</p> <p>GSC: In the LGS Ground Station Controller Screen</p> <ul style="list-style-type: none"> • Select Operations from the menu bar • Choose Operations Schedule • In the activities section the 3 events will appear. 	<p>The CSIS journal will indicate transferred successfully to the TDF and GSC. Please verify passes have been scheduled on the TDF and GSC.</p>
12.	<p>Verify the CSIS journal is counting down to the event you scheduled.</p>	<p>The CSIS journal will indicate transferred successfully to the TDF and GSC.</p>
13.	<p>Verify the CSIS sends ephemeris to the GSC prior to the event.</p>	<p>The journal will indicate: Sending converted ephemeris file autoload.orb to the GSC. File autoload.orb transferred successfully. Please ensure the GSC has received the updated ephemeris. Prepass support is done for L7 event at <i>2006 ddd hh:mm:ss.</i> Next contact....</p>
14.	<p>Physically verify the file is sent. On the GSC: Open Windows Explorer</p> <ul style="list-style-type: none"> • Navigate to c:/lgs/gsc/ephem • Verify autoload.orb has a current time stamp. <p>In the LGS Ground Station Controller Screen</p> <ul style="list-style-type: none"> • Select Databases from the menu bar • Choose Ephemeris Data • In the screen that appears choose Landsat 7 • Verify the input format (Upper Right) shows IIRV. 	
15.	<p>Monitor the event on the GSC and TDF.</p>	
16.	<p>Repeat steps 12-15 for the remaining events.</p>	
17.	<p>Stop the CSIS software %quit.sh</p>	
18.	<p>%cd \$CSIS_HOME/setup</p>	
19.	<p>Change the CSIS_POLL_INTERVAL_SEC back to 900 seconds %vi csis_setup.ini</p>	

A.2.5. Force Wakeup

	Step	Notes or Outcome
1.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	
2.	Wait 1 minute	
3.	Force the CSIS to process % wakeup.sh	The CSIS will check the delivery directories and reformat the files, immediately.

A.2.6. Modify Configuration

	Step	Notes or Outcome
1.	Stop the CSIS software %quit.sh	The journal will indicate: CSIS terminated by user. CSIS is terminating.
2.	%cd \$CSIS_HOME/setup	
3.	Change CSIS_POLL_INTERVAL_SEC to 10 seconds %vi csis_setup.ini	
4.	Restart the CSIS following Start CSIS (A.2.1) Steps 1-3	Monitor the journal for polling. The CSIS will utilize the minimum of 30 seconds.
5.	Stop the CSIS software %quit.sh	The journal will indicate: CSIS terminated by user. CSIS is terminating.
6.	%cd \$CSIS_HOME/setup	
7.	Change the polling intervals to 600 seconds %vi csis_setup.ini	
8.	Restart the CSIS following Start CSIS (A.2.1) Steps 1-3	Monitor the journal for polling. The CSIS will poll every 10 minutes.
9.	Stop the CSIS software %quit.sh	The journal will indicate: CSIS terminated by user. CSIS is terminating.
10.	%cd \$CSIS_HOME/setup	
11.	Change the polling intervals to the original value %vi csis_setup.ini	

A.2.7. Monitor Journal

	Step	Notes or Outcome
1.	Start the CSIS Journal %cd /usr/CSIS/ %tail -f CSIS_Journal	
2.	Verify journal entries are clear and concise.	
3.	Verify dates and times of contacts are consistent and not confusing.	

A.2.8. Multi-mission Operations

	Step	Notes or Outcome
1.	Perform L5 Support (A.2.3) and L7 Support (A.2.4) in tandem with alternating L5 and L7 missions.	Remember to notify the L7 MOC.
2.	Verify the CSIS correctly identifies upcoming supports and processes information accordingly.	

A.3 Failure Scenarios

A.3.1. Configuration Files

	Step	Notes or Outcome
1.	Stop the CSIS software %quit.sh	
2.	%cd \$CSIS_HOME/setup	

3.	%mv csis_setup.ini \$CSIS_HOME	Another location may be used as well.
4.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	The journal will indicate: Unable to open file csis_setup.ini. Failed to read CSIS settings from csis_setup.ini. CSIS failed to start!
5.	Stop the CSIS software %quit.sh	
6.	Go to where you moved the .ini file %cd \$CSIS_HOME	
7.	%mv csis_setup.ini \$CSIS_HOME/setup	
8.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	The CSIS will start as normal.
9.	Stop the CSIS software %quit.sh	
10.	%cd \$CSIS_HOME/setup	
11.	%mv ftplogin.ini \$CSIS_HOME	Another location may be used as well.
12.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	The journal will indicate: Unable to find file /usr/CSIS/st/setup/ftlogin.ini CSIS failed to start.
13.	Stop the CSIS software %quit.sh	
14.	Go to where you moved the .ini file %cd \$CSIS_HOME	
15.	%mv ftplogin.ini \$CSIS_HOME/setup	
16.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	The CSIS will start as normal.

A.3.2. Destination Not Available

	Step	Notes or Outcome
1.	Shut down the CSIS software %quit.sh	
2.	%cd \$CSIS_HOME/setup	
3.	Change the password for either the TDF or GSC to an incorrect value. %vi ftplogin.ini	
4.	Restart the CSIS following Start CSIS (A.2.1) Steps 1-3	
5.	Verify FTP failure	The CSIS will indicate processing and ftp of files. The window in which the CSIS software was started will reflect an error with the FTP. The CSIS will indicate an FTP failure.
6.	Shut down the CSIS software %quit.sh	
7.	%cd \$CSIS_HOME/setup	
8.	Change the passwords back to the correct values. %vi ftplogin.ini	

A.3.3. Recovery

	Step	Notes or Outcome
1.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	
2.	With the CSIS running shutdown the PC via the toolbar.	

3.	Turn off the PC for 1 minute	
4.	Restart the PC and log on.	
5.	Restart the CSIS following Start CSIS (A.2.1) Steps 1-3	The CSIS will restart, re-ingest, and ftp the most recent schedules and ephemeris.

A.3.4. Unsupported Missions

	Step	Notes or Outcome
1.	Start the CSIS following Start CSIS (A.2.1) Steps 1-3	
2.	Place an Aqua schedule in one of the delivery directories.	
3.	Force the CSIS to process % wakeup.sh	The CSIS will not process the file and the journal will indicate: Aqua and Terra contact schedule files not currently supported. Cannot reformat the contact schedule file xxx
4.	Place a Terra schedule in one of the delivery directories.	
5.	Force the CSIS to process % wakeup.sh	The CSIS will not process the file and the journal will indicate: Aqua and Terra contact schedule files not currently supported. Cannot reformat the contact schedule file xxx

References

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USGS/EROS, LGS-312, Control and Schedule Interface (CSIS) Software User Guide, Version 2, June 2007.